REMARKS

The Examiner is respectfully requested to withdraw the rejections and allow Claims 68, 10-14 and 16-20, the only claims pending and currently under examination in this application.

Claims 6 and 12 have been amended to specify that the microvalve includes a phase reversible gel material having a first porosity that can be modulated in response to an applied stimulus to provide a second porosity. The contacting steps of these claims have been amended to specify that components of the fluidic sample having molecular weights above a threshold level are excluded from entering the micro-valve and thereby remain outside of the micro-valve. These claims have also been amended to specify that the methods include modulating the porosity of the micro-valve by applying a stimulus to the gel having a first porosity to provide the gel with a second porosity that selectively allows sample components that have a molecular weight below the threshold value to at least move into the micro-valve while excluding entry into the micro-valve of sample components having molecular weights above the threshold value. Support for these amendments can be found in the specification and the originally filed claims, e.g., original Claims 9 and 15, and page 13, lines 17-24; page 7, lines 12-24; and page 7 line 31 to page 8, line 28.

Claims 10 and 16 have been amended to change the dependencies. Claim 17 has been amended to specify that the kit includes at least one of: instructions for practicing the method of Claim 6 and means for obtaining instructions for practicing the method of Claim 6, instead of specifying Claim 1.

Claims 1, 5, 9 and 15 have been canceled. The cancellation of claims is made without prejudice to renewal, without intent to acquiesce to any rejection, and without intent to surrender any subject matter encompassed by the canceled claims. The Applicants expressly reserve the right to pursue any canceled subject matter in one or more continuation and/or divisional applications.

As no new matter has been added by the above amendment, the Applicants respectfully request entry thereof.

REJECTION UNDER 35 U.S.C. §102(b)

Claims 1-16 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Balch et al. (US 5,746,901). The Applicants respectfully submit that Balch et al. do not anticipate Claims 6-16 (Claims 1-5 have been cancelled).

Independent Claims 6 and 12, and the claims that depend therefrom, have been amended to specify a phase reversible gel material that has a first porosity that can be modulated in response to an applied stimulus to provide a second porosity. The claims have also been amended to specify that the methods include modulating the porosity of the micro-valve by applying the stimulus to the gel having a first porosity to provide the gel with a second porosity that selectively allows sample components that have a molecular weight below the threshold value to at least move into said micro-valve while excluding entry into the micro-valve of sample components having molecular weights above the threshold value. Balch et al. do not teach a method that includes these elements.

Balch et al. do not teach a method that includes applying a stimulus to a gel material having a first porosity to provide the gel material with a second porosity. In fact, Balch et al. fail to teach modulating a matrix to have any particular pore size, let alone modulating a gel matrix of a first porosity by applying a stimulus thereto to provide the gel matrix with a second porosity that is permissive of certain sample components below a particular molecular weight and exclusive of sample components above a particular molecular weight.

Furthermore, Balch et al. also fail to teach a step that includes contacting the sieving matrix, whether porosity-modulated or not, with a multi-component fluidic sample such that certain components of the fluidic sample having molecular weights above a threshold level are excluded from entering the matrix and thereby remain outside of the matrix and components of the fluidic sample having molecular weights below a threshold level at least enter the matrix. In fact, Balch et al. teaches that all sample components enter the matrix: "Biomolecules are loaded into the microchannels...and are separated as they migrate down the channel." (col. 5, lines 31-34, emphasis added) In other

words, Balch et al. do not teach that any sample components are excluded from entering the matrix and in fact teach that they all "migrate down the channel".

In making this rejection, the Examiner asserts that if Balch et al. employ the same material as the present invention, it is inherent that the matrix would function in the same manner. However, the Applicants respectfully submit that the function of a claimed micro-valve of the subject invention is dependant on a variety of different factors, one of which is the novel modulation of the micro-valve gel material by an applied stimulus and more specifically on the modulation of the porosity of the gel to go from a first porosity to a second porosity that selectively allows sample components that have a molecular weight below a threshold value to at least move into the micro-valve while excluding entry into the micro-valve of sample components having molecular weights above a threshold value. Accordingly, function of the claimed micro-valves is not simply solely dependant upon the material of the claimed micro-valves, but also on the novel modulation of the micro-valve gel to go from a first porosity to a second porosity as described above.

Accordingly, for at least the reason described above, Balch et al. do not anticipate Claims 6-16. As such, the Applicants respectfully request that this rejection be withdrawn.

Claims 6-16 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Nelson et al. (US 5,746,901). The Applicants respectfully submit that Nelson et al. do not anticipate Claims 6-16 (Claims 1-5 have been canceled), as Nelson et al. do not teach each and every claimed limitation.

Independent Claims 6 and 12, and the claims that depend therefrom, have been amended to specify a phase reversible gel material having a first porosity that can be modulated in response to an applied stimulus to provide a second porosity. The claims have also been amended to specify that the methods include modulating the porosity of the micro-valve by applying the stimulus to the gel having a first porosity to provide the gel with a second porosity that selectively allows sample components that have a molecular weight below the threshold value to at least move into said micro-valve while excluding entry into the micro-valve of sample components having molecular

weights above the threshold value. Nelson et al. do not teach a method that includes these elements.

Nelson et al. do not teach a method that includes applying a stimulus to a gel material having a first porosity to provide the gel material with a second porosity. In fact, Nelson et al. do not teach a step of modulating the enrichment medium or any other medium at all to change the porosity thereof, let alone modulating the porosity of a gel medium by applying a stimulus to the gel medium having a first porosity to provide the gel medium with a second porosity that selectively allows sample components that have a molecular weight below a threshold value to at least move into the medium while excluding entry into the medium of sample components having molecular weights above a threshold level.

Nelson et al. also fail to teach a step that includes contacting the enrichment medium or any other medium, porosity -modulated or otherwise, with a multi-component fluidic sample such that certain components of the fluidic sample having molecular weights above a threshold level are excluded from entering the medium and thereby remain outside of the medium and components of the fluidic sample having molecular weights below a threshold level at least enter the medium. For example, Nelson et al. teach that all of the components of a sample are moved into an enrichment channel. In other words, in regards to the enrichment channel, not only do Nelson et al. fail to teach the modulation step as claimed in the subject claims, but Nelson et al. also fail to teach that there are components of the sample that remain outside the enrichment channel as Nelson et al. teach that all of the sample components are moved into the enrichment channel.

The Examiner refers to the paragraph bridging cols. 5 and 6 that describes an enrichment channel embodiment having two gels: a first gel of large porosity and second gel of fine porosity. (Col. 11, lines 25-58 describing Fig. 6, further describes this enrichment channel embodiment). However, such embodiment still fails to teach the claimed invention.

Not only do Nelson fail to teach modulating the porosity of a gel to go from a first porosity to a second porosity, but in describing this enrichment channel embodiment Nelson et al. clearly state that the boundary between these

two gels occurs in the intersection of the main electrophoretic flow path (col. 6, lines 2-4; see also intersection 94 of Fig. 6). Nelson et al. teach that sample is moved under an electric field through the first gel and a band of components is condensed at the interface between the two gels. Of note is that Nelson et al. do not teach that any components are not moved into and through this first gel. Another electric field is then applied to move this band of components through the main electrophoretic flow path -- away from the second gel. In other words, Nelson et al. do not teach that some components of the band are moved into the second gel while other components are excluded from entering the second gel due to molecular weights, as all of the components of the band at the interface between the first gel and the second gel are moved through the main electrophoretic flow path.

Furthermore, for reasons analogous to those described above for Balch et al. the Applicants respectfully submit that the invention of Nelson et al. does not inherently function as the subject invention, even if Nelson et al. employed the same material in the enrichment channel as employed in the subject invention. For example, Nelson et al. do not teach the modulation of any component of the invention of Nelson et al. in the manner as claimed in Claims 6-16, nor do Nelson et al. teach the contacting step of claims 6-16.

For at least the reasons described above, Nelson et al. do not anticipate Claims 6-16. As such, the Applicants respectfully request that this rejection be withdrawn.

REJECTION UNDER 35 U.S.C. §103

Claims 17-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Balch et al. or Nelson et al. The Applicant respectfully submit that Claims 17-20 are patentable under 35 U.S. C. §103(a) over Balch et al. and Nelson et al.

Independent Claim 17, and claims 18-20 that depend therefrom, recite a kit that includes at least one of: instructions for practicing the method of Claim 6 or means for obtaining instructions for practicing the method of Claim 6. Accordingly, a component of the claimed kits is directed towards instructions for practicing the method of Claim 6 or means for obtaining such instructions.

As such, in order to render obvious Claims 17-20, a reference or combination of references must teach or suggest at least one of: instructions for practicing the method of Claim 6 or means for obtaining instructions for practicing the method of Claim 6.

However, as described above neither Balch et al. nor Nelson et al. teach or even suggest all of the claimed limitations of Claim 6 and thus there is no motivation to modify these inventions to include instructions for practicing the method of Claim 6 or means for obtaining instructions for practicing the method of Claim 6 as neither teaches such a method.

The Examiner asserts that it would have been obvious to provide instructions or manuals that would explain to one that may desire to use the device to perform experimental procedures. However, as the devices and experimental procedures of the cited references differ from that of the subject invention, it would not be obvious to modify any such instructions provided for the inventions of these cited references to instruct a user to practice the subject invention as claimed in Claim 6 as the method of Claim 6 is note taught or suggested in the cited references.

For at least the reasons described above, Claims 17-20 are patentable over Balch et al. and Nelson et al. As such, the Applicants respectfully request that this rejection be withdrawn.

CONCLUSION

The applicants respectfully submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone the undersigned at (650) 327-3400.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 10991975-1.

Respectfully submitted,

Date: 12/23/03

By: _____
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9. **(Cancel)**

10. **(Currently Amended)** The method according to Claim ~~6~~ 9, wherein said stimulus is a change in temperature.

11. **(Original)** The method according to Claim 6, wherein said threshold value is about 1000 daltons and said method is a method of desalting said multi-component fluidic sample.

12. **(Currently Amended)** A method for concentrating a multi-component fluidic sample with respect to at least one constituent thereof, said method comprising:

introducing said multi-component fluidic sample into a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible gel material having a first porosity that can be modulated in response to an applied stimulus to provide a second porosity; and

contacting said introduced multi-component fluidic sample with said micro-valve under conditions sufficient for components of said multi-component fluidic sample having a molecular weight below a threshold value to at least move into said micro-valve while the remaining components of said complex fluidic sample having molecular weights above a threshold level are excluded from entering said micro-valve and thereby remain outside of said micro-valve;

wherein said method comprises modulating the porosity of said micro-valve by applying said stimulus to said gel having said first porosity to provide said gel with said second porosity that selectively allows sample components that have a molecular weight below said threshold value to at least move into said micro-valve while excluding entry into said micro-valve of sample components having molecular weights above said threshold value, and further wherein said multi-component fluidic sample is concentrated with respect to at least one constituent thereof.

13. **(Original)** The method according to Claim 12, wherein said phase reversible material is a phase reversible polymer.

14. **(Original)** The method according to Claim 12, wherein said phase reversible material is thermo-reversible.

15. **(Cancel)**

16. **(Currently Amended)** The method according to Claim 12 ~~15~~, wherein said stimulus is a change in temperature.

17. **(Currently Amended)** A kit for use in selectively separating at least one component from a multi-component fluidic sample, said kit comprising:

(a) a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible material; and

(b) at least one of:

(i) instructions for practicing the method of Claim 6 ~~4~~; and

(ii) means for obtaining instructions for practicing the method of Claim 6 ~~4~~; wherein said instructions and means for obtaining the same are recorded onto a substrate.

18. **(Original)** The kit according to Claim 17, wherein said substrate is a printable substrate.

19. **(Original)** The kit according to Claim 17, wherein said substrate is an electronically recordable substrate.

20. **(Original)** The kit according to Claim 17, wherein said kit further comprises a phase reversing means.